UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
OSB2001-0172-FEC

January 23, 2002

Mr. Lawrence C. Evans
US Army Corps of Engineers
Regulatory Branch, CENWP-OP-G
P.O. Box 2946
Portland, Oregon 97208-2946

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Act Essential Fish Habitat Consultation for the Twin Creeks Transit Oriented Development-Griffin Creek Restoration and Irrigation Diversion Project, Jackson County, Oregon (Corps No. 2001-00166)

Dear Mr. Evans:

Enclosed is a biological opinion (Opinion) prepared by the National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act (ESA) that addresses the proposed Twin Creeks Transit Oriented Development-Griffin Creek Restoration and Irrigation Diversion Project in Jackson County, Oregon. Your consultation initiation letter indicated that this action was likely to adversely affect Southern Oregon/Northern California Coasts (SONC) coho salmon (*Oncorhynchus kisutch*). The NMFS concludes in this Opinion that the proposed action is not likely to jeopardize the SONC coho salmon, or destroy or adversely modify designated critical habitat. This document also serves as consultation on essential fish habitat (EFH) under Public Law 104-297, the Sustainable Fisheries Act of 1996, as it amended the Magnuson-Stevens Fishery Conservation and Management Act.

NMFS suspended this consultation on September 12, 2001 after U. S. District Court Judge Michael Hogan issued an order setting aside the listing of OC coho as threatened under the Endangered Species Act. On December 14, 2001, the Ninth U. S. Circuit Court of Appeals stayed Judge Hogan's order pending resolution of an appeal, thus reinstating OC coho as a threatened species. Although NMFS promptly resumed this consultation, the temporary suspension due to changes in the legal status of OC coho added significantly to the time necessary for its completion. We apologize for any inconvenience caused by this delay.

SONC coho salmon were listed as threatened under the ESA on May 6, 1997 (62 FR 24588), with critical habitat designated on May 5, 1999 (64 FR 54049). Interim protective regulations for SONC coho were issued under section 4(d) of the ESA on July 18, 1997 (62 FR 38479). Pursuant to Section 7 of the ESA, NMFS has included reasonable and prudent measures with non-discretionary terms and conditions that NMFS believes are necessary and appropriate to

minimize the potential for take associated with these projects. NMFS also concludes these actions would adversely affect EFH for coho and chinook salmon, and appropriate conservation recommendations are provided. Response to the EFH conservation recommendations is required within 30 days of receipt of this letter and Opinion.

Questions regarding this letter or attached Opinion should be directed to Frank Bird of my staff in the Oregon Habitat Branch at 541.957.3383.

Sincerely,

for Michael R Crouse

D. Robert Lohn
Regional Administrator

cc: Steve Wille, U.S. Fish and Wildlife Service

Endangered Species Act -Section 7 Consultation
&
Magnuson-Stevens Act
Essential Fish Habitat Consultation

BIOLOGICAL OPINION

Twin Creeks Transit Oriented Development-Griffin Creek
Restoration and Irrigation Diversion Project

Agency: U. S. Army Corps of Engineers

Consultation Conducted By: National Marine Fisheries Service,
Northwest Region

Date Issued: January 23, 2002

Issued by: Michael R Crouse
for
D. Robert Lohn
Regional Administrator

Refer to: OSB2001-0172-FEC

TABLE OF CONTENTS

1. ENDANGERED SPECIES ACT 1
1.1. Background 1
1.2 Proposed Action 1
1.2.1 Griffin Creek Restoration 2
1.2.2 Griffin Creek Bridge Construction 4
1.2.3 Irrigation Diversion Consolidation 5
1.3 Biological Information and Critical Habitat 6
1.4 Evaluating Proposed Actions 6
1.4.1 Biological Requirements 7
1.4.1.1 SONC coho salmon 8
1.4.2 Environmental Baseline 8
1.5 Analysis of Effects 9
1.5.1 Effects of Proposed Action 9
1.5.1.1 Griffin Creek Restoration 9
1.5.1.2 Griffin Creek Bridge Construction 10
1.5.1.3 Griffin Creek Diversion Consolidation 11
1.5.2. Effects on Critical Habitat 11
1.5.3. Cumulative Effects 12
1.6. Conclusion 12
1.7. Reinitiation of Consultation 13

2. INCIDENTAL TAKE STATEMENT 13
2.1. Amount or Extent of the Take 13
2.2. Reasonable and Prudent Measures 14
2.3. Terms and Conditions 15

3. MAGNUSON-STEVENS ACT 19
3.1 Background 19
3.2 Magnuson-Stevens Fishery Conservation and Management Act 19
3.3 Proposed Actions 20
3.4 Effects of Proposed Action 20
3.5 EFH Conservation Recommendations 20
3.6 Statutory Response Requirement 21
3.7 Consultation Renewal 21

4. LITERATURE CITED 21

1. ENDANGERED SPECIES ACT

1.1. Background

On July 30, 2001, the National Marine Fisheries Service (NMFS) received a biological assessment and request from the Corps of Engineers (Corps) for Endangered Species Act (ESA) section 7 formal consultation on the Twin Creeks Transit Oriented Development-Griffin Creek Restoration and Irrigation Diversion project located in Jackson County, Oregon. The development project includes restoration of approximately two-thirds of a mile of Griffin Creek, construction of a new bridge across Griffin Creek, and replacement of two irrigation diversion structures in Griffin Creek with a single diversion structure. This biological opinion (Opinion) considers the potential effects of the proposed actions on Southern Oregon/Northern California Coast (SONC) coho salmon (*Oncorhynchus kisutch*). SONC coho salmon were listed as threatened under the ESA on May 6, 1997 (62 FR 24588), with critical habitat designated on May 5, 1999 (64 FR 54049). Interim protective regulations for SONC coho salmon were issued under section 4(d) of the ESA on July 18, 1997 (62 FR 38479). This consultation is undertaken under section 7(a)(2) of the ESA, and its implementing regulations, 50 CFR Part 402.

The proposed action is part of a proposal to develop a 230-acre site lying between Griffin Creek, Taylor Road and Highway 99 in Central Point, Jackson County, Oregon. The development would include residential complexes supporting multiple modes of transportation, a bus transit center, commercial sites and open space. The development is centered around a realignment of approximately two-thirds of a mile of Griffin Creek between Taylor Road and Highway 99, which creates a natural stream channel and open space used for recreation and storm water detention. The project also includes installation of a bridge crossing and consolidation of irrigation diversion structures.

The objective of this Opinion is to determine whether the Twin Creeks Transit Oriented Development-Griffin Creek Restoration and Irrigation Diversion project is likely to jeopardize the continued existence of SONC coho salmon, or destroy or adversely modify designated critical habitat.

1.2 Proposed Action

The proposed action involves: (1) Restoration of two-thirds of a mile of Griffin Creek, (2) construction of one bridge across Griffin Creek, and 3) consolidation of two Griffin Creek irrigation diversion structures into one structure. All work will occur within the Oregon Department of Fish & Wildlife (ODFW) approved in-water work window of June 15 to September 15. In addition, work for these three projects will be done in the dry, since work will be within the constructed channel. A description of the three main project components is detailed below.

1.2.1 Griffin Creek Restoration

The Griffin Creek restoration portion of the project is designed to restore the natural configuration and function of the reach of Griffin Creek within the planned development site to improve stream function and provide fish and wildlife habitat and open space. Within the project area, Griffin Creek is currently channelized and deeply incised, and little riparian habitat or native riparian vegetation exists. Habitat for fish and wildlife is highly degraded and fragmented. Most water present in the channel results from upstream irrigation inflows from water brought into the system from other drainages, including Klamath Basin water. The relocation and restoration of this reach of Griffin Creek will improve water quality, aquatic and riparian habitat, and provide flood control for a major portion of the lower watershed. Restoration of this reach will include establishing gradients, sinuosity, and stream geomorphology similar to natural systems found in similar settings.

Inter-Fluve, Inc. completed a basin study and channel design (Inter-Fluve, 2000) for the restoration phase of the project. Appendix A in the BA illustrates and describes these channel design specifications. The channel design was completed first to facilitate project development design around the new channel boundaries. Because the channel design was not constrained by pre-existing development, it will maximize habitat value and channel function. The below project design information appears in the BA:

> To properly design the Griffin Creek restoration project, basin hydrologic characteristics were determined. The 2-, 5-, 10-, 25-, 50-, and 100-year return interval discharges were calculated for use in characterizing the current conditions and as units of measure for base designs. Since no gauge data was available within the project reach, indirect methods were used to estimate discharges. Field observations and hydrologic and hydraulic analyses indicated that a channel-forming flow of 930 cfs would convey sediment through the new channel. This flow was used in a hydraulic model to determine what channel width, depth and gradient would be needed to transport the current sediment load in the new channel. A channel hydraulic analysis was completed to determine the shear stress for designing a stable size of material and maintaining sediment continuity through the new channel.
>
> Hydraulic channel flow conditions were estimated using the U.S. Army Corps of Engineer's (COE) HEC-RAS hydraulic model (version 2.2). HEC-RAS is a one-dimensional, steady state open channel flow hydraulic model. Input data required to perform the analysis includes: channel cross section and slope, limits of channel and flood plain boundaries, channel and flood plain roughness coefficients and channel discharge. An existing FEMA FIS HEC-RAS hydraulic model was used to define existing channel hydraulics. The model was copied and modified to reflect design conditions. Through an iterative approach, a design was developed that accounted for backwater effects from bridges, increased sinuosity and reduced gradient. The design template channel cross section also included a floodplain terrace.
>
> Channel and floodplain Manning's n roughness coefficients were estimated using methods set by the COE. Values of Manning's n are estimated as a basic value which is modified to account for increased resistance to flow by channel surface condition, variability of channel cross sectional area and flow path, obstructions to flow, vegetation type and density and channel meandering. For this project, a Manning roughness coefficient of 0.033 was used in the channel and 0.07 for mature riparian and upland vegetation.

Widening Griffin Creek will reduce incision, increase sinuosity and improve riparian and aquatic habitat. This will decrease the channel shear needed to move sediment through the reach and maintain adequate water movement throughout the project reach. Failure to do so could result in unwanted deposition, loss of flood conveyance, and localized flooding.

Flood water discharges also require larger areas for energy dissipation due to increasing roughness as newly established native riparian vegetation grows. As more native species and trees are established within the new and much wider flood-prone area, their impacts to local hydraulics will increase at flood flows. The project design incorporates new flood-prone areas that are wide enough to allow full maturation of future riparian areas without the loss of flood water conveyance.

The project requires a new stream channel that will transport upstream sediment and water while also improving aquatic habitat. To accomplish sediment transport goals, the lower half of the new channel must have dimensions similar to the current channel. The current channel configuration relies on the steep and resilient bank angles provided by cemented alluvial material. Constructing a new channel will destroy this resiliency, and the channel dimensions needed to convey upstream sediment would cause erosion of the banks composed of disturbed on-site material. Therefore, in order to construct a stable channel in the new location, all boundary materials will have to be imported to the channel following rough grading.

Substrate needed to form the channel bottom, bars and inside bend banks will be composed of ten inch-minus river gravel. Currently, the channel capacity and transport ability is achieved by the steep bank angles enabled by the cemented gravel and sand. A similar function will be achieved by using ten-inch minus stream gravel material in the substrate and within stream banks. Soil lifts with a rock toe will be constructed on the outside of bends.

Soil lift construction will take place after the new stream is over-excavated and the new substrate is imported and graded out. The soil lift and new bank will be founded on imported rock which can withstand shear stress at flood flows. The rock will be placed under the imported stream substrate and continue two feet above stream bottom at a 2H:1V slope.

Following the rock toe placement, soil lifts will be constructed out of coir fabric and imported or salvaged soil from the surrounding Central Point-TOD development. Forms needed to build the soil lifts will be constructed as specified in Appendix A of the BA. Soil lifts will continue three feet above the top of the rock toe and five feet above the new channel bottom. Three soil lifts will be constructed. Each lift will be one foot high. The top of the soil lifts will match the grade of the new floodplain that extends out laterally. Floodplain slopes will vary between a 10H:1V and 3H:1V slope, depending on location of the stream banks relative to infrastructure. Lift construction details are described in Appendix A in the BA.

The channel alignment will be staked before construction. Rough grading of the new alignment will be completed using bulldozers and scrapers. The channel will be over-excavated to allow the fill of 1.5 feet of imported river gravel and 1.5 feet of rock toe material along the outsides of each bend. The final grade will have a bottom width of 17 feet, top width of 35 feet and a slope of 0.0035 percent. Following rough channel excavation, the floodplain above the new channel will be graded at a 10H:1V slope out to the limits of the new flood plain. If necessary, the edges will transition to existing grade at a 3H:1V slope. Limits of flood plain and stream centerline can be observed in Appendix A. Following the bank construction, pool forms will be developed and refined in the channel using a small excavator. Low flow channel details will be constructed throughout the reach at the same time.

After the bulk of the new channel is finished, construction of the top and bottom ends of the new channel will require a pump around procedure. The bottom connection of the new channel to Griffin Creek will be constructed first. Griffin Creek will be dammed above and below the construction area; fish will be removed from the dewatered section, and the water will be pumped downstream around the construction site. Any fish present at the site will be prevented from entering the pump unit by a series of upstream and downstream nets. When construction is complete, the dams will be removed. The upstream connection of the new channel to Griffin Creek will be constructed in a similar fashion.

Diverting water to the new channel on Griffin Creek will require dewatering of the existing stream channel, collection and removal of stranded fish and other aquatic organisms, and burial of the old channel. Prior to opening the upstream end of the new channel, water will be pumped into the new channel. As the water recedes in the old channel, dip nets will be used to capture stranded fish. These fish will be placed in buckets and transported downstream below the project reach and placed in Griffin Creek. Residual pools will be electro-fished by qualified personnel, with any fish captured transported below the project reach. Once all fish have been removed from the old channel, a berm will be placed across the old channel at the upstream end and armored to create the new stream bank, thus effectively cutting off all water flows into the old channel. Any temporary dams will be removed, and Griffin Creek will be allowed to flow naturally into the new channel. The old channel will be filled in and become part of the future housing development.

Revegetation of the new stream channel will consist of installing seed mixes and woody plantings along the reconstructed stream corridor at the appropriate time of year. All plants will be native species selected for their suitability to the anticipated hydrologic regimes and soil types. As a result, two planting zones have been developed. The channel edge zone will be inundated by flows associated with a one year recurrence interval and includes a fabric encapsulated soil bank treatment. The floodplain will be drier and less frequently inundated by flood flows. Woody plantings will include native willow cuttings approximately four feet long, to be installed horizontally between fabric lifts at the stream edge concurrently with construction. In addition, specialized four inch by 14 inch containerized plants that are well suited for planting into stream banks will be installed into re-sloped banks after the stream corridor construction is completed.

1.2.2 Griffin Creek Bridge Construction

The proposed bridge provides the only access across the new Griffin Creek channel within the project, connecting the project with a main access route to Central Point. The proposed crossing will provide for an uninterrupted, natural streambed. The bridge will be a series of reinforced concrete box girders cabled together to form a flat surface for paving, supported at either end of the bridge on concrete bridge abutments. Riprap will be installed under the bridge to reduce erosion of the bridge abutment bases. The bridge will be approximately 48 feet wide and 42 feet long, accommodating two lanes of vehicle traffic, two bicycle lanes and two pedestrian lanes.

Construction of the bridge, approaches, and associated stream channel, will be done in the dry while the new stream channel is inactive and under construction. The concrete span bridge will rest upon concrete abutments protected from erosion by riprap placed along the base and along adjacent stream banks. The riprap will be placed to maintain natural streambed configuration and function. In addition, all bridge lighting will be designed to prevent light from falling on stream surfaces.

1.2.3 Irrigation Diversion Consolidation

Two diversion dams, Blue Moon and Crater High School, located within the existing incised Griffin Creek channel, are currently barriers to fish passage and will be removed and consolidated into one diversion structure within the reconstructed stream channel. The Blue Moon diversion provides water to the Rogue River Valley Irrigation District and the Crater High School diversion provides water to playing fields associated with Crater High School. The new diversion would continue to provide water to both users and will provide unobstructed fish passage through the reach of Griffin Creek within the project.

The new diversion will have a capacity of 12 cubic feet per second and be an integral structure comprised of a flow control sill with a fishway and screened diversion. Both the fishway and screened diversion would meet NMFS standards. Water level control will be required along the creek to provide a minimum flow depth of three and a half feet at the screens during the irrigation season (April-October). A concrete sill across the width of the channel with removable flashboards will provide water level control upstream of the structure. The flashboards will be removed during the non-irrigation season to allow unimpeded transport of sediments and high stream flows along the creek and to allow unobstructed fish passage. An integral pool and weir fishway will provide fish passage past the flow control structure during the irrigation season at all stream flows. A low flow weir notch, sized to pass one cfs, will concentrate flows with a maximum drop of nine inches to enable fish passage during low summer flows. Sloped sides along the crest of the fishway weir will pass higher flows. Excess flows will be able to pass over the flashboards to provide flood relief. Removable baffles in the weirs could be included to aid in flushing accumulated sediments through the ladder. The fishway pools are proposed to be a minimum of three feet deep following NMFS recommendations. The pools will be five feet long by five feet wide to provide sufficient energy dissipation to encourage fish passage. A total of five drops are required to gain three and a half feet in elevation. This will be provided by four pools and a downstream scour hole.

The diversion structure will contain the following elements:

1. A trash rack at the entrance to limit the size and amount of debris entrained into the diversion during operation, and which will require routine manual cleaning.
2. Stop log guides at the entrance to completely shut off stream flow into the facility during the non-irrigation season.
3. An inlet flow control gate (e.g. Waterman gate) to provide control of the total flow entering the diversion.
4. A conveyance canal to move the diverted flow along the diversion, past the screens and into the bypass canal.
5. Proposed vertical fixed plate diversion fish screens fitted with an electrically powered gang-brush cleaner (Note: there is not sufficient control of the water level in the diversion to satisfy the hydraulic headwater requirements of rotary drum type screens.).
6. A pump vault, pumps and irrigation delivery system located behind the screens (to be designed by others).

7. An overshot flow control ramp gate to control the water level in the diversion facility, which includes undershot sluice ports to provide accumulated sediment flushing.
8. A bypass downwell, or sump, to dissipate ramp gate flow energy to reduce injury potential to fish.
9. A bypass return to discharge fish and debris back to Griffin Creek. The bypass discharge into Griffin Creek will be adjacent to the fishway entrance (downstream end). This will reduce the stream length with reduced instream flows as well as reduce, to the extent possible, distraction flow for upstream migrating fish.

The new diversion will be located near the bridge described above to facilitate maintenance and logistical support. The diversion will be located on the outside of a channel bend to capitalize on natural stream processes and channel configuration. A reduction in sediment volume is expected at this location, particularly during low flows, which will reduce the amount of sediment entering the diversion. During high winter flows, the diversion will be sealed to protect it from sedimentation.

1.3 Biological Information and Critical Habitat

The Southern Oregon/Northern California (SONC) coho salmon occur in the proposed action area. SONC coho salmon were listed as threatened under the (ESA) on May 6, 1997 (62 FR 24588). Critical habitat was designated on May 5, 1999 (64 FR 54049). Interim protective regulations for SONC coho were issued under section 4(d) of the ESA on July 18, 1997 (62 FR 38479). Critical habitat is designated to include all waterways, substrate, and adjacent riparian zones below longstanding, naturally impassable barriers accessible to listed coho salmon between Cape Blanco, Oregon and Punta Gorda, California. The adjacent riparian zone is defined as the physical environment that may influence the following functions: Shade, sediment delivery to the stream, nutrient or chemical regulation, streambank stability, and the input of large woody debris/organic matter. Biological information for SONC coho salmon is found in Nehlsen et. al. (1991); Nickelson et. al. (1992); and Weitkamp et. al. (1995). Long-term trends suggest that natural populations are not self-sustaining.

1.4 Evaluating Proposed Actions

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). NMFS must determine whether the action is likely to jeopardize the listed species and/or whether the action is likely to destroy or adversely modify critical habitat. This analysis involves the initial steps of: (1) Defining the biological requirements and current status of the listed species, and (2) evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, NMFS evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NMFS must consider the estimated level of mortality attributable to: (1) Collective effects of the proposed or continuing action, (2) the environmental baseline, and

(3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed salmonid's life stages that occur beyond the action area. If NMFS finds that the action is likely to jeopardize, NMFS must identify reasonable and prudent alternatives for the action.

Furthermore, NMFS evaluates whether the action, directly or indirectly, is likely to destroy or adversely modify the listed species' designated critical habitat. The NMFS must determine whether habitat modifications appreciably diminish the value of critical habitat for both survival and recovery of the listed species. NMFS identifies those effects of the action that impair the function of any essential element of critical habitat. NMFS then considers whether such impairment appreciably diminishes the habitat's value for the species' survival and recovery. If NMFS concludes that the action will destroy or adversely modify critical habitat it must identify any reasonable and prudent alternatives available.

For the proposed action, NMFS' jeopardy analysis considers direct or indirect mortality of fish attributable to the action. NMFS' critical habitat analysis considers the extent to which the proposed action impairs the function of essential elements necessary for juvenile and adult migration, spawning, and rearing of SONC coho salmon under the existing environmental baseline. NMFS' essential fish habitat (EFH) analysis considers the effects of proposed actions on EFH and associated species and their life history stages, including cumulative effects and the magnitude of such effects.

1.4.1 Biological Requirements

The first step in the methods the NMFS uses for applying the ESA section 7(a)(2) to listed salmon is to define the species' biological requirements that are most relevant to each consultation. NMFS also considers the current status of the listed species, taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NMFS starts with the determinations made in its decision to list SONC coho salmon for ESA protection, and also considers new data available that is relevant to the determination.

The relevant biological requirements are those for SONC coho salmon to survive and recover to naturally reproducing population levels, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sufficient in the natural environment. For this consultation, the biological requirements are improved habitat characteristics that function to support successful adult and juvenile migration, spawning, and rearing.

1.4.1.1 SONC coho salmon

Adult SONC coho salmon enter the Rogue River from September through January, with peak entry occurring in October. River entry and spawning may extend through January, depending

on flow and temperature regimes within the river. Spawning occurs from October through December in tributary streams. Emergent fry generally rear for a year or two in their natal streams before migrating to the ocean as smolts. Juvenile coho salmon smolt outmigration generally occurs from March through June, with peak outmigration occurring in April and May. Juvenile outmigration patterns are strongly influenced by photoperiod, stream flows, water temperature, and the lunar phase. Coho salmon smolt remain in the lower Rogue River and estuary for about a week before entry into the ocean, where they complete their ocean life-cycle. Coho salmon generally spend 18 months in the ocean before returning to freshwater streams to spawn and complete the cycle. Coho salmon are not known to currently inhabit Griffin Creek (Haight, ODFW 2000), but are present in Bear Creek, into which Griffin Creek flows. Long-term trends suggest that natural populations of SONC coho salmon are not self-sustaining and remain at risk of extinction.

1.4.2 Environmental Baseline

The current range-wide status of the SONC ESU may be found in Nickelson et. al. (1992) and Weitkamp et. al. (1995). The identified action will occur within the range of the SONC coho salmon ESU. The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area (project area) involved in the proposed action (50 CFR 404.02). The direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing fish passage, hydrologic functions and processes, stream channel modification, increase in sedimentation and turbidity, displacement of migrating coho salmon, injury or killing of coho salmon, and pollutant discharge into Bear Creek and thence into the Rogue River. Indirect effects may occur throughout the watershed where actions described in this Opinion lead to additional activities or affect ecological functions contributing to aquatic and riparian habitat degradation. For this consultation, the action area includes the reach of Griffin Creek within the development area, extending downstream to its confluence with Bear Creek, including the adjacent riparian zone which is defined as the area from the edge of the channel migration zone upslope one site potential tree (slope distance).

The project is within Griffin Creek, a tributary of Bear Creek, which is a tributary of the middle Rogue River. The Bear Creek watershed covers about 700 square miles, and Griffin Creek subwatershed a much smaller portion. The Griffin Creek watershed originates in low hills dividing the Applegate River and Rogue River, and reflects extensive urban and agricultural development. Griffin Creek flows through the city of Central Point. During the summer most of the flow for Griffin Creek originates from upstream contributions from irrigation runoff from out-of-basin water transfers.

The Rogue Basin drains 5058 square miles in Southwestern Oregon and Northern California. The Rogue River flows west from the headwaters in the Cascades near Crater Lake through interior valleys and coast range mountains of Southwest Oregon to the Pacific Ocean. The Rogue system has two main dams managed by the U.S. Army Corps of Engineers and hundreds of smaller water diversions and dams scattered across the basin affecting fish passage. Lost Creek Dam was completed in 1977 at RM 157 on the mainstem of the Rogue. The Applegate

Dam was completed in 1980 at RM 47 on the Applegate River. The dams have significantly altered the natural flow and temperature regime, and impaired fish passage and distribution in the Rogue River Basin.

Griffin Creek has been listed on the Oregon Department of Environmental Quality (DEQ) 303d list of water bodies with water quality problems for temperature and bacteria; Bear Creek has been listed for habitat modification, flow modification, bacteria and temperature.

The NMFS Matrix of Pathways and Indicators (NMFS 1996) was used to assess the current condition of various coho salmon habitat parameters in the Griffin Creek watershed. Use of the Matrix identified all habitat indicators as either at risk or not properly functioning within the action area, with all but road density and location and physical barriers listed as not properly functioning.

1.5 Analysis of Effects

1.5.1 Effects of Proposed Action

The effects determination in this Opinion was made using a method for evaluating current aquatic conditions, the environmental baseline, and predicting effects of actions on them. This process is described in NMFS (1996). The effects of actions are expressed in terms of the expected effect (restore, maintain, or degrade) on aquatic habitat factors in the action area. Effects analysis related to this project will be confined to the three components of the project: Griffin Creek Restoration, Griffin Creek Bridge Construction, and Griffin Creek Diversion Consolidation.

1.5.1.1 Griffin Creek Restoration

The NMFS expects short-term and long-term effects associated with the Griffin Creek channel restoration. Effects will be associated with construction of the new stream channel and deconstruction of the old channel. In the aggregate, while there will be some short-term negligible adverse effects, long-term benefits to aquatic, riparian and fishery resources will accrue.

All work for this component of the project will occur in the dry, as the constructed stream channel will not be connected to the existing Griffin Creek channel until the constructed channel is complete and stabilized. Specific short-term effects include minor amounts of sediment generated from the disturbed streambanks of the constructed channel as it is connected to Griffin Creek. Exposed soils could be transported by storm runoff to Griffin Creek, depending on the area exposed, intensity of the storm, and effectiveness of sediment control measures. Addition of sediment to downstream reaches of Griffin Creek could adversely affect migration, rearing and spawning behavior of any coho which may use the area. Sediment-laden water could negatively impact the health of fishes by clogging gills and abrading skin, as well as adversely affecting aquatic macroinvertebrates, important sources of food organisms for salmonids (Spence

et al. 1996). Further, excessive sediment can alter the ability of fishes to find habitual spawning and rearing areas by filling pools and embedding spawning gravels, or prevent reestablishment of populations in newly opened or created habitat. However, it is likely any sediment will be flushed out of the system, either quickly during high flow events, or gradually as winter precipitation exerts its affect on the new construction.

If construction equipment is operated in or near the creek, it could injure or kill individual fish, destroy redds, or spill hazardous materials into the stream. In addition, soil compaction at the site could occur, hindering revegetation efforts and increasing sheet flow, as well as reducing infiltration during rainfall events. Also, removal of riparian vegetation could eliminate sources of cover for fish, reduce the effectiveness of riparian vegetation in runoff filtering, and reduce temperature moderating influences of stream-side vegetation.

Construction-related effects from the adjacent development are also possible. Spills of chemicals, fuels or other contaminants could enter Griffin Creek through the stormwater system or overland, depending on quantities released or precipitation amounts, and the effectiveness of cleanup and containment measures. Leaks or accidental spills of fuel, oils, chemicals, and concrete leachate that reach Griffin Creek during construction of project could potentially kill or harm coho salmon or other aquatic organisms coho are dependent upon. Use of appropriate containment measures should minimize these effects.

Beneficial effects associated with this component of the project include increased and improved fish passage, spawning and rearing habitats. Stabilization of the new stream channel and establishment of streambank riparian vegetation should also result in improved riparian habitats beneficial to a diverse community of fish and wildlife species. Partial treatment of stormwater that had previously transported agricultural sediment and nutrient laden runoff to Griffin Creek will now occur, and the system will increase the ability of the reconstructed reach to handle floods. Release of minor amounts of sediment from channel construction, disturbance of stream banks through contouring and planting, stormwater runoff, and other minor impacts associated with development of the new channel, is not expected to, in quantifiable terms, adversely affect coho salmon.

1.5.1.2 Griffin Creek Bridge Construction

Since bridge and bridge abutment construction will occur in a dewatered stream channel, no adverse effects are expected from bridge construction work. Bridge construction may create short-term sediment effects from loose materials left in the stream channel from bridge abutment construction, once the stream has water flowing through it again. This should be minor as the site will be isolated from the active part of the channel and most loose materials either stabilized through plantings and ground cover or removed prior to channel activation. Release of minor amounts of sediment from bridge construction activities, or use of concrete and riprap to construct bridge abutments, is not expected to, in quantifiable terms, adversely affect coho salmon.

1.5.1.3 Griffin Creek Diversion Consolidation

The Griffin Creek diversion consolidation will occur in the dry. As a result, no impacts to Griffin Creek are expected from construction. Prior to putting water into the system and activating the diversion, the diversion site will be stabilized and cleaned up to minimize input of sediment and other contaminants into Griffin Creek. At activation, there will be a small flush of sediment through the system, but this will be minimal and transitory. Effects of the construction work will dissipate as the site stabilizes and as vegetation establishes itself.

There may be adverse effects associated with the fish passage facility and the diversion structures once they are operational. Fish passage for juvenile salmonids may be a problem during low summer flows (minimum of one cubic feet per second). However, since it is unlikely that fish will be present in the system during low flow conditions due to the timing of irrigation withdrawals, timing of fish use, and existing water quality problems (temperature, nutrients from adjacent agricultural lands, low flows, pH, etc.) associated with the extensive urban and agriculture development upstream from the site, no impact to listed fish is expected. Impacts from fish interaction with the trash rack, diversion structure, fish pass facility, and fish bypass, may occur during periods when fish are present (adult migration period in winter high flows and any subsequent outmigration of juveniles during spring high flows). However, the planned regular maintenance of these structures will minimize impacts.

The net effect of the diversion consolidation project will be a positive one for listed fish; improved fish passage at the site and maintenance of flows within the stream channel will reduce adverse impacts to listed fish. Construction and operation of the consolidated diversion facility is not expected to, in quantifiable terms, adversely affect coho salmon.

1.5.2. Effects on Critical Habitat

NMFS designates critical habitat based on physical and biological features that are essential to the listed species. Essential features for designated critical habitat include substrate, water quality, water quantity, water temperature, food, riparian vegetation, access, water velocity, space and safe passage. Critical habitat for SONC coho salmon consists of all waterways below naturally impassable barriers including the project area. The adjacent riparian zone is also included in the designation. This zone is defined as the area that provides the following functions: Shade, sediment, nutrient/chemical regulation, streambank stability, and input of large woody debris/organic matter.

The proposed actions will affect critical habitat. The temporary impacts to critical habitat from Griffin Creek channel reconstruction, bridge construction, and diversion consolidation are not expected to diminish functions in the long term, and will likely contribute to improvement in many of the habitat functions. Other long-term effects include improvements in instream and riparian habitats within the reconstructed reach as the site stabilizes. Short-term effects from sedimentation and turbidity and loss of benthic habitats are expected, although recovery from these effects will occur within one to three years.

1.5.3. Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." For the purposes of this analysis, the action area is defined as the reach of Griffin Creek within the development area, extending downstream to its confluence with Bear Creek, including the adjacent riparian zone.

NMFS is not aware of any significant change in non-Federal activities that are reasonably certain to occur. In the future, NMFS assumes that future private and State actions will continue at similar intensities as in recent years. Future activities associated with continued development of the Twin Creeks Transit Oriented Development-Griffin Creek Restoration and Irrigation Diversion project are expected to continue and may add additional unanticipated impacts as development occurs. Future projects will be reviewed through separate section 7 consultation processes and therefore are not considered cumulative effects.

1.6. Conclusion

NMFS has determined that, based on the available information, the Twin Creeks Transit Oriented Development-Griffin Creek Restoration and Irrigation Diversion project is not likely to jeopardize the continued existence of Southern Oregon/Northern California coho salmon or result in the destruction or adverse modification of critical habitat. NMFS used the best available scientific and commercial data to apply its jeopardy analysis, when analyzing the effects of the proposed action on the biological requirements of the species relative to the environmental baseline, together with cumulative effects. NMFS applied its evaluation methodology (NMFS 1996) to the proposed action and found that it would cause minor, short-term degradation of anadromous salmonid habitat due to increases in sedimentation and turbidity, loss of benthic resources, and instream habitat loss. These effects will disappear over the long term through natural recovery processes, and are expected to contribute to improved fish passage over the long term. For the proposed actions, the NMFS expects that the effects will maintain or restore each of the habitat elements over the long term, greater than three to five years, based on the current condition of the site. In the short term, increases in sedimentation and turbidity, changes to hydraulics and channel geometry, and loss of benthic habitats is expected. Fish will not be killed, as the stream does not contain SONC coho salmon due to the downstream barrier and instream conditions at the time of construction. The potential effects from the sum total of proposed actions, including habitat enhancement activities, are expected to maintain, restore or enhance the function of coho salmon habitat conditions.

1.7. Reinitiation of Consultation

Consultation must be reinitiated if: (1) The amount or extent of taking specified in the incidental take statement is exceeded, or is expected to be exceeded, (2) new information reveals effects of the action may affect listed species in a way not previously considered, (3) the action is modified in a way that causes an effect on listed species that was not previously considered, (4) a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16). To reinitiate consultation, ODOT must contact the Habitat Conservation Division (Oregon Habitat Branch) of NMFS.

2. INCIDENTAL TAKE STATEMENT

Sections 4(d) and 9 of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. Harass is defined as actions that create the likelihood of injuring listed species to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

2.1. Amount or Extent of the Take

NMFS anticipates that the action covered by this Opinion is reasonably certain to result in incidental take of SONC coho salmon because of detrimental effects from a brief increase in sedimentation and turbidity, temporary disruption to rearing conditions, and the loss of habitat (non-lethal) while the new channel stabilizes. Effects of actions such as these are largely unquantifiable in the short term, and are not expected to be measurable as long-term effects on coho salmon habitat or population levels. Therefore, even though NMFS expects some low level of incidental take to occur due to the actions covered by this Opinion, the best scientific and commercial data available are not sufficient to enable NMFS to estimate a specific amount of incidental take to the species. In instances such as these, the NMFS designates the expected level of take as "unquantifiable." Based on the information in the biological assessment, NMFS anticipates that an unquantifiable amount of incidental take could occur as a result of the actions

covered by this Opinion. For the purposes of this Opinion, the extent of non-lethal take is limited to Griffin Creek.

2.2. Reasonable and Prudent Measures

The NMFS believes that the following reasonable and prudent measures are necessary and appropriate to minimize take of the above species. Minimizing the amount and extent of take is essential to avoid jeopardy to the listed species.

The Corps shall:

1. Minimize the amount and extent of incidental take from construction activities within the proposed action area by ensuring that measures are taken to limit the duration and extent of inwater work, and to time such work when the impacts to SONC coho salmon are minimized.

2. Minimize the amount and extent of incidental take from construction activities in or near watercourses by ensuring that effective erosion and sedimentation control measures are developed, implemented, and maintained to avoid or minimize the movement of soils and sediment both into and within watercourses and to stabilize bare soil over both the short term and the long term.

3. Minimize the amount and extent of incidental take from constructions activities in or near watercourses by ensuring that an effective spill prevention, containment, and control plan is developed, implemented, and maintained to avoid or minimize point-source pollution both into and within watercourses over the short term and the long term.

4. Minimize the extent of impacts to aquatic or riparian habitats, or where impacts are unavoidable, replace or restore lost habitat functions.

5. To ensure effectiveness of implementation of the reasonable and prudent measures, all fish removal and handling, spill containment, prevention and control plans, and hazardous materials sites shall be monitored and evaluated both during and following construction, and meet criteria as described below in the terms and conditions.

2.3. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the Corps must comply with the following terms and conditions, which will implement the reasonable and prudent measures described above. These terms and conditions should be incorporated into construction contracts and subcontracts to ensure that the work is carried out in the manner prescribed. Implementation of the terms and conditions within this Opinion will further reduce the risk of impacts to fish and critical habitat. These terms and conditions are non-discretionary.

1. To implement Reasonable and Prudent Measure #1, the Corps shall ensure that:

    a. Fish passage shall be provided for both adult and juvenile forms of all salmonid species in the existing Griffin Creek channel throughout the construction period, but fish shall be excluded from the new channel until construction is complete.

    b. All work within the active channel of Griffin Creek will be completed within the NMFS/ODFW approved inwater work period, June 15 to September 15. Any adjustments to the inwater work period will first be approved by, and coordinated with, NMFS and ODFW. An extension of the inwater work window may require reinitiation of section 7 consultation.

    c. The alteration or disturbance of stream bottom, streambanks and existing riparian vegetation will be minimized. Where stream bottom or bank work is necessary, restoration of stream bottom configuration and channel morphology must occur within that construction period, including removal of all materials placed during construction, and bank protection material shall be placed to maintain normal waterway configuration.

    d. The diversion or withdrawal of all water from the stream, if any, and used for construction will comply with all state and Federal laws, particularly those that require a temporary water right and screening of intakes. The Corps shall be responsible for informing all contractors of their obligations to comply with existing, applicable statutes.

    e. A Corps or ODFW biologist will be on site during construction to ensure that activities which may affect fish contained within the work area are removed by using the least destructive technology that is feasible, prior to any construction activity occurring within the isolation facility, including de-watering.

        i. Within three months of any fish removal activities, the Corps shall provide a report to NMFS that contains all of the requisite information for reporting take.

        ii. In the event that any listed species is injured or killed, care will be taken in handling of injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death and ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

2. To implement Reasonable and Prudent Measure #2, the Corps shall ensure that:

a. An erosion control plan (ECP) is prepared by Corps resource specialists and implemented by the Contractor. The ECP will outline how and to what specifications various erosion control devices will be installed to meet water quality standards, and will provide a specific inspection protocol and time response. Erosion control measures shall be sufficient to ensure compliance with applicable water quality standards and this Opinion. The ECP shall be maintained on site and shall be available for review upon request. Erosion and sedimentation control measures may include (but are not limited to) the following:

i. Sediment detention measures such as placement of weed-free straw, silt fences, straw bale barriers, temporary seeding, storm drain inlet protection, sediment traps, and construction of temporary settling basins where appropriate.

ii. Erosion control blankets or heavy duty matting (e.g., jute) may be used on steep, unstable slopes.

iii. Removal of all instream sediment created by project activities.

iv. Bypassing stream flows around construction sites and stabilizing construction sites prior to returning flow to the channel.

b. Effective erosion control measures shall be in-place at all times during the contract. Construction within the floodplain or stream channel will not begin until all temporary erosion controls are in place, either downstream in dry channels or downslope of project activities within riparian areas.

c. All exposed areas will be replanted with native vegetation. Erosion control planting, and placement of erosion control blankets and mats will be completed on all areas of bare soil within seven days of completion of work at any given exposed site within 150 feet of any waterbody, and in all areas during the wet season (after October 1). All other areas will be stabilized within 14 days of project completion. Efforts will be made to cover exposed areas as soon as possible after exposure.

d. All erosion control devices will be inspected throughout the construction period to ensure that they are working adequately. Work crews will be mobilized to make immediate repairs to the erosion controls, or to install erosion controls during working and off-hours. Should a control measure not function effectively, the control measure will be immediately repaired or replaced. Additional erosion controls will be installed as necessary.

e. In the event that soil erosion and sediment resulting from construction activities is not effectively controlled, the contractor will limit the amount of disturbed area to that which can be adequately controlled.

f. Prior to operating within 150 feet of any stream channel, inspect and clean all construction equipment. Remove external oil, grease, dirt, and mud. Untreated wash and rinse water will not be discharged into streams and rivers without adequate treatment.

g. Materials removed construction shall only be placed in upland locations at least 300 feet from the two-year floodplain to ensure that excavated materials do not re-enter the two-year floodplain or stream channel. Conservation of topsoil (removal, storage and reuse) will be employed.

h. Where feasible, sediment-laden water created by construction activities shall be filtered before it enters Griffin Creek.

i. Project actions meet or exceed all provisions of the Clean Water Act (40 CFR Subchapter D) and Oregon Department of Environmental Quality for the National Pollution Discharge Elimination System (NPDES) permit and the Rogue River Basin (OAR Chapter 340, Division 41).

3. To implement Reasonable and Prudent Measure #3, the Corps shall ensure that:

a. The contractor will develop and implement a site-specific spill prevention, containment, and control plan (SPCCP), and is responsible for containment and removal of any toxicants released. The contractor will be monitored by the Corps to ensure compliance with this SPCCP.

b. Any spill will be reported to the NMFS.

i. In the event of a hazardous materials or petrochemical spill, immediate action shall be taken to recovery toxic materials from further impacting aquatic or riparian resources.

ii. In the event of a hazardous materials or petrochemical spill, a detailed description of the quantity, type, source, reason for the spill, and actions taken to recover materials will be documented.

c. Temporary access roads and work pads within 300 feet of the two-year floodplain will have containment measures in place that minimizes any potential of petrochemicals or hazardous materials from entering the two-year floodplain or stream channel.

d. Refueling and hazardous materials.

i. The refueling plans are submitted to NMFS for review and approval prior to any on-the-ground construction operations.

(1) Fuel storage locations within 300 feet of the two-year floodplain shall have containment measures in place that meets or exceeds 100% containment.

(2) Auxiliary fuel tanks are not stored on access roads, or within the two-year floodplain.

ii. Hazardous materials stored within 300 feet of the two-year floodplain shall have containment measures in place that meets or exceeds 100% containment.

4. To implement Reasonable and Prudent Measure #4, the Corps shall ensure that:

a. Alteration of native vegetation is minimized. Where possible, native vegetation will be removed in a manner that ensures that roots are left intact.

b. All exposed areas within the riparian corridor will replant with endemic riparian species appropriate for the local overstory and understory plant community.

5. To implement Reasonable and Prudent Measure #5, the Corps shall ensure that:

a. Within three months following completion of any fish removal activities, a report that contains all of the information for reporting take is provided to NMFS.

b. Upon completion of the project, a copy of all monitoring reports on the effectiveness of implementing and maintaining the SPCCPs are provided to NMFS.

3. MAGNUSON-STEVENS ACT

3.1 Background

The objective of the essential fish habitat (EFH) consultation is to determine whether the proposed action may adversely affect designated EFH for relevant species, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action.

3.2 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), requires the inclusion of EFH descriptions in Federal fishery management plans. In addition, the MSA requires Federal agencies to consult with NMFS on activities that may adversely affect EFH.

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting the definition of essential fish habitat: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.110).

Section 305(b) of the MSA (16 U.S.C. 1855(b)) requires that:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH.
- NMFS shall provide conservation recommendations for any Federal or State activity that may adversely affect EFH.
- Federal agencies shall within 30 days after receiving conservation recommendations from NMFS provide a detailed response in writing to NMFS regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NMFS, the Federal agency shall explain its reasons for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH

consultation with NMFS is required by Federal agencies undertaking, permitting or funding activities that may adversely affect EFH, regardless of its location.

3.3 Proposed Actions

The proposed actions are detailed above in section 1.2. The action area includes the reach of Griffin Creek within the development area, extending downstream to its confluence with Bear Creek, a tributary to the Rogue River. This area has been designated as EFH for chinook salmon and coho salmon.

3.4 Effects of Proposed Action

The Twin Creeks Transit Oriented Development-Griffin Creek Restoration and Irrigation Diversion project is not likely to adversely affect the distribution and abundance of adult or juvenile coho salmon or chinook salmon. The proposed action will result in short-term impacts to salmonid habitat through increases in sedimentation and turbidity, and alteration of instream habitats. Long-term spatial and temporal (greater than one year) effects will principally affect benthic habitats, channel morphology, and flow dynamics within Griffin Creek. Information submitted by the Corps in the BA is sufficient for NMFS to conclude that the effects of the proposed actions are likely to adversely affect EFH. NMFS also believes that the project design features proposed as an integral part of the actions would avoid, minimize, or otherwise offset potential adverse impacts to designated EFH, as long as terms and conditions as described in the ESA section above are incorporated into the project, and will even likely lead to increased benefits for anadromous fish species.

3.5 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the Magnuson-Stevens Act, NMFS is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. The conservation measures proposed for the project by the Corps, and all of the Reasonable and Prudent Measures and the Terms and Conditions contained in Sections 2.2 and 2.3 are applicable to salmon EFH. Therefore, NMFS incorporates each of those measures here as EFH conservation recommendations.

3.6 Statutory Response Requirement

Please note that the Magnuson-Stevens Act (section 305(b)) and 50 CFR 600.920(j) requires the Federal agency to provide a written response to NMFS after receiving EFH conservation recommendations within 30 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the adverse impacts of the activity on EFH. If the response is inconsistent with a conservation recommendation from NMFS, the agency must explain its reasons for not following the recommendation.

3.7 Consultation Renewal

The Corps must reinitiate EFH consultation with NMFS if any of the proposed actions are substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR Part 600.920).

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